

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Kevin David Potter
Application No.: 10/532,438
Filing Date: December 28, 2005
Examiner: Nathan J. Bloom
Art Unit: 2624
Confirmation No.: 9117
For: POSITIONAL MEASUREMENT OF A FEATURE WITHIN AN
IMAGE

VIA EFS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**STATEMENT OF SUBSTANCE OF INTERVIEW
UNDER 37 C.F.R § 1.133**

Dear Sir:

Applicants submit this Statement of Substance of Interview in accordance with 37 C.F.R § 1.133 to be made of record for the above-identified application for patent. Applicants respectfully request entry of the statement as set forth herein.

Applicants' representative thank the Examiner for participating in a telephone interview held May 7, 2009. In the interview, the substance of an Office Action made final and mailed February 19, 2009, was discussed with the Examiner. In addition, the interview included a discussion of certain facts regarding the subject invention and pending claims in view of cited documents, U.S. Patent No. 5,280,530 (hereinafter "Trew") and U.S. Patent No. 6,483,538 (hereinafter "Hu").

Applicants having also reviewed an Interview Summary mailed on May 11 2009, first

wish to make a brief comment regarding statements provided therein. In the Interview Summary, it is written, "Examiner explained that the currently existing claim language only required that the feature be moved relative to the pixels." Applicants respectfully disagree with such a statement and respectfully point out that the existing claim language does not *only* require that a feature be moved relative to the pixels. Applicants respectfully point out that the claim language discloses a number of elements. Claim 61, one of the independent claims is used by way of example and discloses, among many things: (a) a feature is translated relative to the pixels; (b) by a pixel translation value and (c) wherein the sum of the pixel fraction and the pixel translation value is an integer value. A copy of Claim 61 is shown below as last written in the Amendment dated November 10, 2008, and is used to illustrate Applicants previous statement.

Claim 61. (Currently Amended) A method for determining coordinates of a feature comprising:

providing a first image including the feature, the first image comprising a plurality of pixels;

determining a first estimate of coordinates of the feature to within a fraction of a pixel;

translating the feature relative to the pixels by a pixel translation value, wherein the sum of the pixel fraction and pixel translation value is an integer value;

determining a second estimate of coordinates of the translated feature to within a fraction of a pixel; and

summing the pixel fractions of the first estimate with the second estimate to derive a refined estimate of coordinates.

The Examiner further stated in the interview held on May 7, 2009, that the Examiner believed that "translating the feature relative to the pixels" was taught by the cited documents because a test image as disclosed by Hu contains a feature also present in the reference image and when the test image is generated, the location of the feature in the test image is different from that of the location of the feature in the reference image and consequently the feature was said to be "shifted." This statement by the Examiner shows that the Examiner is relying

on two distinct aspects of Hu to show a single combination of features claimed by Applicants, which is “translating the feature relative to the pixels by a pixel translation value.” In reply, Applicants respectfully submitted in the interview that such a reliance on Hu as just described by the Examiner has no support. Applicants outline their reasoning below, as was also discussed in brief in the interview held on May 7, 2009.

For discussion purposes, Applicants herewith break Claim 61 into several elements in order to assist in showing why previous statements made by the Examiner do not support a rejection of the claims.

Claim 61, lines 1-4:

61. (Currently Amended) A method for determining coordinates of a feature comprising:

providing a first image including the feature, the first image comprising a plurality of pixels;

The Examiner stated that Trew describes the features above at Column 2, lines 20 -37; Column 3, lines 65+; and Column 4, lines 20-65. This means that the Examiner is specifically referring to the use of an initial template image that includes the desired feature.

Claim 61, line 5:

determining a first estimate of coordinates of the feature . . .

The Examiner stated that Trew describes the above feature by relying on the same passages as described with the previous section, namely, Column 2, lines 20 -37; Column 3, lines 65+; and Column 4, lines 20-65. The Examiner’s reason was due to the “determination of the coordinates of a feature in a series of images.”

Claim 61, lines 5-6:

*... to within a fraction of a
pixel;*

The Examiner stated that Hu teaches the above feature. It is noted that Hu specifically teaches a curve-fit step (46), which is described in a text box for Figure 3 as “quad curve-fit for fractional pixel position about peak location.” The nearest integer shift position determined at curve-fit step (46) is input to an update shift position step (48) (see Column 3, lines 18, 19). This is relevant for the reasons set forth below.

Claim 61, line 7:

translating the feature relative to the pixels ...

The Examiner stated in the final Office Action mailed February 19, 2009 (pg. 4), “the feature described by Trew in view of Hu is described by pixels, and is shifted in relation to pixels.” In the telephone interview held May 7, 2009, the Examiner further stated that the above feature (i.e., *translating the feature relative to the pixels*) was taught by Hu because its test image (26) contains a feature (25) that is also present in reference image (24) and when test image (26) is generated, by passing a reference video signal (10) through a video processing network (12), the location of feature (25) in test image (26) is “shifted” relative to feature (25) in reference image (24). Another way of describing this is that when test image (26) is generated, the position of feature (25) is different to the position of feature (25) in reference image (24), thus feature (25) has “shifted.” Hu demonstrates this in Figure 2.

Claim 61, lines 7-8:

*... by a pixel translation value, wherein
the sum of the pixel fraction and pixel translation value is an integer value;*

The Examiner stated that Hu, at Column 3, lines 5-20, implicitly discloses the above features. Applicants find that the passage referred to by the Examiner specifically describes

performing a fast Fourier transform (FFT) to the pixels of the images that lie within test region (28) of each image. In the FFT domain, a cross-correlation is then performed by Hu to establish peak (44), which is the amount of shift in position between the reference image (24) and test image (26). In the final Office Action mailed February 19, 2009 (pg. 4), the Examiner emphasized how Hu teaches the shift of the measured pixel position to the nearest integer pixel position. Unfortunately, such statements show that the Examiner is relying on two distinct and differing aspects of Hu to reject a single combination of features of Applicants claim. For example, the “nearest integer pixel shift” of Hu as determined at curve-fit step (46) is a value that governs how far test region (28) provided over test image (26) is to be shifted relative to test image (26) and is designed to increase the cross-correlation previously described above. Thus, the Examiner is relying on both a relationship between reference image (24) and test image (26) to teach the feature of *translating the feature relative to the pixels* as well as a relationship based on moving test region (28) provided over test image (26) relative to test image (26) to show the feature of *by a pixel translation value*. Applicants respectfully point out that this is taking the language and disclosure of Hu out of context, such that dissimilar features of Hu are forced together in order to arrive at a reason for rejecting the claim. Applicants respectfully point the Examiner to statements previously made by Applicants in both a Supplemental Amendment dated December 9, 2008 and to a fax dated April 15, 2009, entitled “Outline of Topics for Discussion” that accompanied an Applicant Initiated Interview Request Form. In both previously submitted documents, Applicants provided a statement of fact that shifting test region (28) provided over test image (26) relative to test image (26) as disclosed by Hu does not translate feature (25) within test image (26) relative to the pixels thereof. Consequently, it is not correct for the Examiner to try to combine two dissimilar elements of Hu to arrive at an incorrect statement that Hu teaches *translating the feature relative to the pixels by a pixel translation value*.

Even if the Examiner considers that a final step described by Hu of aligning its two images (e.g., reference image and test image) are the same as the feature of Claim 61, line 7 (i.e., *translating the feature relative to the pixels by a pixel translation value*), Hu does not suggest or describe *translating the feature relative to the pixel by the specific pixel*

translation value or by a pixel translation value, wherein the sum of the pixel fraction and pixel translation value is an integer value, which are instrumental for performing Applicants' claimed invention (e.g., how aliasing effects on a feature are modeled pursuant to Applicants' specification).

Claim 61, lines 9-12

*determining a second estimate of coordinates of the translated feature to within a fraction of a pixel; and
summing the pixel fractions of the first estimate with the second estimate to derive a refined estimate of coordinates.*

Setting aside for one moment the fact that Hu fails to teach features of Claim 61 at lines 1-8, Hu also specifically fails to describe the above features (i.e., Claim 61, lines 9-12). The Examiner stated that Hu describes such features at Column 3, lines 21-44. However, upon review of Column 3, lines 21-44, it is clear that Hu is specifically teaching performing a cross correlation using an original FFT [referred to by Hu as FFT(ref)] and a newly established FFT [referred to by Hu as FFT(tst)] in order to refine and update the final position. Thus, it is clear that Hu does not use a second determination or estimate as to the coordinates of a feature which has been translated relative to the pixels of an image. And, as such, Hu is incapable of having a second determination benefit from a change in appearance of the feature.

In view of the above and contrary to statements made by the Examiner, Applicants respectfully reiterate that Claim 61 is both novel and non-obvious in view of the cited documents because none of the cited documents may be combined by their own teachings or by what is known to a person of skill in the art in order to arrive at a method as claimed by Applicants, including a method whereby a feature is translated by the specified pixel translation value prior to a second determination of the coordinates of the feature being made.

This is intended to be a written statement as to the substance of a telephone interview held May 7, 2009, to be made of record in the application for patent.

Dated: June 11, 2009

Respectfully submitted,
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